WHAT IS CLAIMED IS:

1. A process for realizing microchannels buried in an integrated structure comprising a monocrystalline silicon substrate, comprising:

forming in said substrate at least a trench; and

obtaining said microchannels starting from a deep cavity characterized by a small surface port obtained through anisotropic etching of said at least one trench, said microchannels being nearly entirely buried in said substrate in a completely monocrystalline structure.

2. The process according to claim 1:

wherein forming comprises:

depositing a mask above said substrate;

opening of windows having a convenient width; and

plasma etching which uses said mask to form said trenches having side walls being essentially orthogonal to the surface of said substrate; and

wherein obtaining comprises:

wet anisotropic etching to form, starting from said trenches, said microchannels, said anisotropic etching step providing different etching speeds due to different atom coordination.

3. The process according to claim 2, wherein plasma etching is performed with a TMAH or KOH solution.

4. The process according to claim 2, wherein opening the windows having a convenient width is performed through photolitographraphy and subsequent plasma etching.

5. The process according to claim 2, wherein deposition of a mask above said substrate comprises a silicon nitride deposition through the CVD deposition.

6. The process according to claim 2, wherein deposition of a mask above said substrate comprises a heavily doped monocrystalline layer deposition.

7. The process according to claim 6, wherein the heavily doped monocrystalline layer has a dopant concentration higher than 10^{19} atoms/cm^3.

8. The process according to claim 1, further comprising a convenient epitaxial new growing operation effective to close an upper part of said microchannels and completely bury the microchannels in monocrystalline silicon.

9. The process according to claim 1, further comprising an oxide, polysilicon or nitride deposition effective to close an upper part of said microchannels and completely bury the microchannels.

10. The process according to claim 1, wherein the wet anisotropic etching step turns said side walls of said trenches into a pair of rotated v-grooves orthogonal to a surface of said substrate and defining rombohedron-shaped microchannels.

11. The process according to claim 1, further comprising depositing a layer of material having a low etching speed.

12. The process according to claim 11, further comprising plasma etching effective to open a region at a trench base.

13. The process according to claim 11, further comprising removing of said layer and in an etching of said substrate in a lower part of said trenches before said plasma etching step.

14. An integrated structure, comprising:

at least a monocrystalline silicon substrate wherein at least one microchannel is formed which is nearly entirely buried inside said substrate.

15. The integrated structure according to claim 14, wherein the microchannel has a generally rhombohedral cross-sectional shape.

16. The integrated structure according to claim 14, further comprising an epitaxially grown silicon layer above the silicon substrate to completely enclose the microchannel in monocrystalline silicon.

17. The integrated structure according to claim 14, further comprising a layer above the silicon substrate to close completely enclose the microchannel.

18. The integrated structure according to claim 17, wherein the layer is an oxide, polysilicon or nitride deposition effective to close an upper part of said microchannel and completely bury the microchannel.

19. A method for forming microchannels, comprising:

forming a narrow elongated trench in a monocrystalline silicon substrate;

performing an anisotropic wet etch of the narrow elongated trench to form a microchannel structure having a generally rhombohedral cross-sectional shape with a top port substrate surface opening; and

closing the top port substrate surface opening of the microchannel structure to entirely enclose the microchannel structure.

20. The method of claim 19 wherein closing comprises epitaxially growing monocrystalline silicon on a surface of the substrate to entirely enclose the microchannel structure in monocrystalline silicon.

21. The method of claim 19 wherein the anisotropic wet etch is made using a TMAH solution.

22. The method of claim 19 wherein the anisotropic wet etch is made using a KHOH solution.

23. The method of claim 19 wherein forming comprises defining a mask with an opening therein at the location of the trench and plasma etching though the mask opening to form the narrow elongated trench.

24. The method of claim 19 wherein the narrow elongated trench has a width at the surface of the substrate of about 1 micrometer.

25. The method of claim 24 wherein the narrow elongated trench has a depth from the surface of the substrate of about 9 micrometers.

26. The method of claim 19 wherein closing comprises depositing a layer of material to close the top port substrate surface opening.

27. The method of claim 26 wherein layer of material is a material taken from the group consisting of a polysilicon, a nitride or an oxide.

28. A method for forming microchannels, comprising:

forming a monocrystalline silicon layer over a monocrytalline silicon substrate;

forming a narrow elongated trench through the monocrystalline layer and into the monocrystalline silicon substrate;

performing an etching of a base region of the narrow elongated trench to form a microchannel structure having a top port opening; and

closing the top port opening of the microchannel structure to entirely enclose the microchannel structure.

29. The method of claim 28 wherein closing comprises growing monocrystalline silicon to close the top port opening in trench above the formed microchannel structure and produce the microchannel structure enclosed completely in monocrystalline silicon.

30. The method of claim 28 wherein performing comprises anisotropically wet etching the base region to define the microchannel structure with a generally rhombohedral cross-sectional shape.

31. The method of claim 30 wherein the anisotropic wet etch is made using a TMAH solution.

32. The method of claim 30 wherein the anisotropic wet etch is made using a KHOH solution.

33. The method of claim 28 wherein forming the narrow elongated trench comprises defining a mask with an opening therein at the location of the trench and plasma etching though the mask opening to form the narrow elongated trench.

34. The method of claim 28 wherein closing comprises depositing a layer of material to close the top port opening.

35. The method of claim 34 wherein layer of material is a material taken from the group consisting of a polysilicon, a nitride or an oxide.